

## Good Graphs and Charts

- Graphs, charts and tables that include a mean must also include a measure of spread, such as standard deviation, standard error or confidence intervals. In a graph, this can be done with error bars bounding the mean.
- Tick marks along axes should be reasonable (e.g., "10, 20, 30..." and not "2, 5, 8...").
- Quantitative data along an axes should be spaced according to it's magnitude (e.g., 8 should be twice as far from the origin as 4).
- The bottom left corner of a graph should be (0,0) unless there is a really good reason.
- Axes should *not* be in logscale unless there is a really good reason.
- All axes must be labeled (e.g., "Bitrate") and given units (e.g., "(Mb/s)").
- Make sure any screenshots and graphs have readable fonts, particularly if they are shrunk to fit. As a guideline, the font in the graph should be the same size or just slightly smaller than the reports main text font.
- Pie charts are almost always the wrong graph type to pick.
- For comparing distributions, instead of a histogram consider a box and whiskers plot or a cumulative distribution function.
- For graphs with 2+ data sets, be sure to include a legend, spaced with a readable font.
- Use of colors in graphs is encouraged, but also differentiate data sets with symbols and hashing.
- A title on the graph is useful for discussions, but when the graph goes in a report the title should be removed and replaced with a figure number and caption.
- All Graphs, Charts (and tables) must be accompanied by have figure numbers followed by a caption, even if the caption is already written inside the figure. E.g. "Figure 4: Results of first trial run."
- Each figure must be referred to at least once in the text, telling the user what to look for in that figure. E.g. "Figure 4 shows...." Capitalize "Figure" when referring to it by number (e.g., "The results in Figure 3...")

Summing this up, below is an example:

<https://web.cs.wpi.edu/~imgd2905/d20/samples/analysis-example.html>

Do not worry about the data - instead look at the form. Note especially the 6 guidelines at the top.